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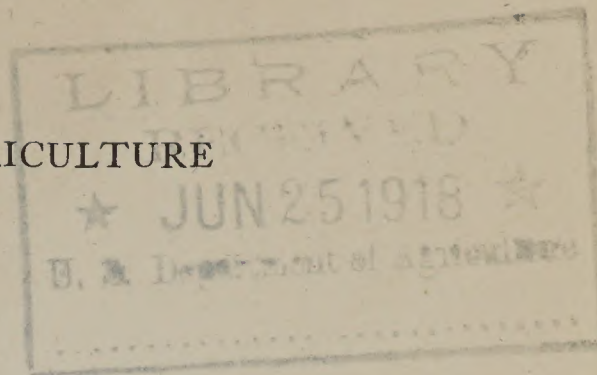




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UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

HENRY S. GRAVES, Forester



In co-operation with

NEWS-PRINT MANUFACTURERS  
ASSOCIATION

PULPWOOD CONSUMPTION  
AND  
WOOD PULP PRODUCTION  
1916

By

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OFFICE OF INDUSTRIAL INVESTIGATIONS,  
FOREST SERVICE



## INTRODUCTORY NOTE

The Forest Service undertook the compilation of statistics on pulpwood consumption and wood pulp production in 1916 in cooperation with the News-Print Manufacturers Association. The conditions in the pulp and paper industry recently have been such as to emphasize the need for current statistics on consumption of pulpwood and production of wood pulp. With cordial cooperation on the part of the officers and members of the News-Print association very complete reports were promptly obtained from nearly all establishments. An advance statement containing essential data was issued February 21, 1917. The association contributed funds for the necessary additional clerical assistance and for printing the final report.



## Pulpwood Consumption and Wood Pulp Production, 1916

### Summary

In 1916 the reported consumption of pulpwood in the United States was larger than for any previous year for which similar statistics were collected. The total quantity used by the 230 establishments reporting was 5,228,558 cords\*, an increase of 757,795 cords, or 17 per cent, over the 4,470,763 cords consumed by the 223 mills reporting in 1914, the last year for which statistics of this kind were compiled. Of the total consumption, 4,444,565 cords were of domestic production and 783,993 cords were imported. The increased consumption of pulpwood naturally resulted in a larger output of wood pulp. The quantity produced during 1916 amounted to 3,271,310 tons and represents an increase of 378,160 tons, or 13 per cent, more than the 2,893,150 tons produced in 1914. Of the total amount of pulp produced during the year, 1,505,547 tons were manufactured by the mechanical process, 1,401,600 tons by the sulphite process, 290,724 tons by the soda process and 73,439 tons by the sulphate process.

The figures given in the above summary and those shown in the balance of the report are based entirely upon the schedules received from the 230 establishments which actually reported their operations for 1916. In addition to the mills which furnished reports, however, there were five from which schedules could not be obtained. In order therefore to make the report as complete as possible, estimates were made for these delinquents. The following table shows figures of pulpwood consumption and wood pulp production as actually reported and as estimated for 1916.

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\* Cord contains 128 cubic feet.



### Reported and Estimated Consumption of Pulpwood and Production of Wood Pulp in 1916

<i>Consumption of Pulpwood</i>		<i>Production of Wood Pulp</i>	
<i>Reported Cords</i>	<i>Estimated Cords</i>	<i>Reported Tons</i>	<i>Estimated Tons</i>
5,228,558	5,272,076	3,271,310	3,294,822

#### Consumption of Pulpwood

Table I shows the quantity of each kind of wood used for pulp as reported by the establishments for the years 1909, 1911, 1914 and 1916 and the per cent which each represents of the respective annual total. During 1916 wood of 21 different species was employed in the manufacture of pulp. Spruce continued to hold first place as the premier pulpwood, contributing 3,101,660 cords or slightly more than 59 per cent of the total number of cords consumed by the industry in 1916. Of this number 2,399,993 cords were of domestic production and 701,667 cords were imported, all from Canada. The consumption of spruce in 1916 was greater than the quantity reported in 1914 by 440,865 cords. Hemlock was second in importance, the quantity used by the plants in 1916 being 760,226, or 14.60 per cent, of the total quantity of all species of wood reported. The quantity reported was greater than the 1914 consumption by 157,472 cords. In the compilation of these statistics for former years aspen was listed as poplar. The latter term as commonly used by the pulp-making trade in the northern states refers entirely to the two species of aspen which grow most abundantly in that region, namely *Populus tremuloides* and *Populus grandidentata*. It does not, however, cover that reported by the mills in Virginia, West Virginia and North Carolina, which is undoubtedly yellow poplar or tulip poplar (*Liriodendron tulipifera*). For this reason in the preparation of the statistics for 1916 the classification of these species has been changed so as to show aspen and yellow poplar figures separately. The total amount of aspen used during the year amounted to 411,696 cords, placing it third in rank among the woods used by the industry. Of the total quantity consumed, 329,370 cords were of do-



TABLE I—Pulpwood consumption—Quantity of wood consumed, by kinds, with per cent of distribution, 1909—1916

KIND OF WOOD	1916		1914		1911		1909	
	Quantity Cords	Per cent distribution	Quantity Cords	Per cent distribution	Quantity Cords	Per cent distribution	Quantity Cords	Per cent distribution
Total.....	5,228,558	100.00	4,470,763	100.00	4,328,052	100.00	4,001,607	100.00
Spruce:								
Domestic .....	2,399,993	45.9	1,892,739	42.3	1,612,355	37.3	1,653,249	41.3
Imported .....	701,667	13.4	768,056	17.2	903,375	20.9	768,332	19.2
Hemlock .....	760,226	14.6	602,754	13.5	616,663	14.2	559,657	14.0
Aspen:								
Domestic .....	329,370	6.3	328,513 <sup>2</sup>	7.3	333,929 <sup>2</sup>	7.7	302,876 <sup>2</sup>	7.6
Imported .....	82,326	1.6	61,644 <sup>3</sup>	1.4	34,295 <sup>3</sup>	.8	25,622 <sup>3</sup>	.6
Balsam fir .....	301,032	5.8	125,296	2.8	191,779	4.4	95,366	2.4
Yellow pine .....	90,310	1.7	141,359	3.2	124,019	2.9	90,885	2.3
Jack pine .....	80,068	1.5	<sup>4</sup>		<sup>4</sup>		<sup>4</sup>	
White fir .....	49,425	1.0	39,648	.9	36,493	.8	37,176	.9
Beech .....	<sup>1</sup>		<sup>1</sup>		44,320	1.0	31,390	.8
Yellow poplar .....	37,974	.7	<sup>5</sup>		<sup>5</sup>		<sup>5</sup>	
Gum .....	37,391	.7	11,935	.3	<sup>1</sup>		<sup>1</sup>	
Maple .....	<sup>1</sup>		<sup>1</sup>		36,979	.9	<sup>1</sup>	
Tamarack .....	33,271	.6	15,320	.3	<sup>1</sup>		<sup>1</sup>	
Cottonwood .....	22,211	.4	18,176	.4	25,043	.6	36,898	.9
Basswood .....	11,481	.2	<sup>1</sup>		<sup>1</sup>		<sup>1</sup>	
All other species .....	90,969	1.7	211,436	4.7	88,268	2.0	151,179	3.8
Slab wood and other mill waste ....	200,844	3.9	253,887	5.7	280,534	6.5	248,977	6.2

<sup>1</sup>—Included in "All other species."

<sup>2</sup>—Listed in former years as "Domestic poplar."

<sup>3</sup>—Listed in former years as "Imported poplar."

<sup>4</sup>—Included in "Yellow pine."

<sup>5</sup>—Included in "Domestic poplar" for years previous to 1916.

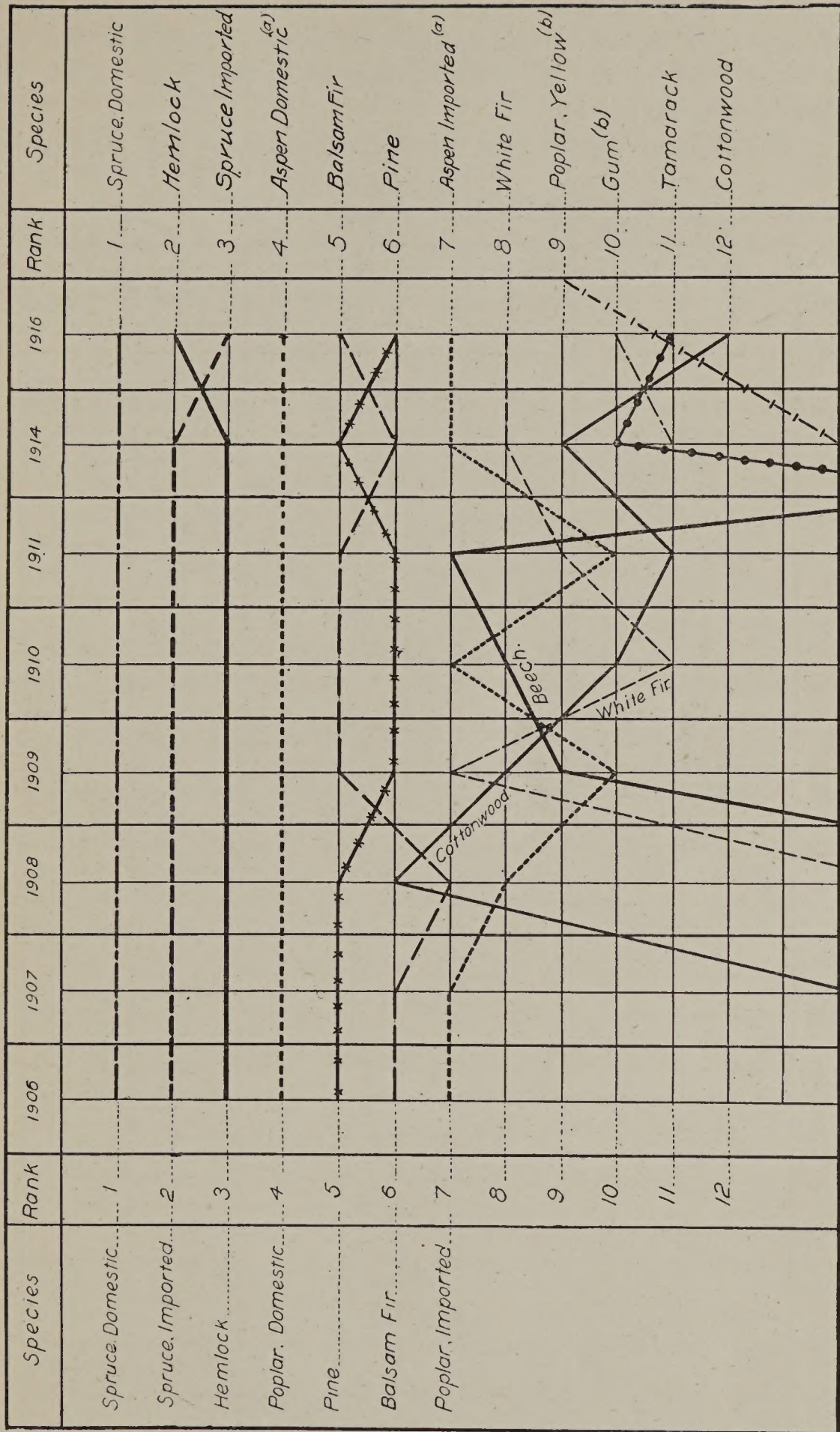


mestic and 82,326 cords of foreign production. Balsam fir came next in the list with a total of 301,032 cords or over twice as much as was used in 1914. In 1914 a total of 141,359 cords of pine was reported by the mills, of which 79,322 cords were listed as southern yellow pine and 62,037 merely as pine without further classification. In this report the pine which was reported has been separated into yellow pine and jack pine. Of the former there were 90,310 cords reported and 80,068 cords of the latter. Taken as a whole and compared with the total quantity reported in 1914, pine shows an increased consumption in 1916 in comparison with the 1914 figures of 29,019 cords. The consumption of white fir in 1916 in the manufacture of pulp was 49,425 cords or 9,777 cords more than was reported in 1914. As explained above yellow poplar has been listed separately in these statistics. The total quantity of this species used during the year was 37,974 cords. Other woods reported were, in the order of the quantity consumed, gum, 37,391 cords, tamarack, 33,271 cords, cottonwood, 22,211 cords, and basswood, 11,481 cords, the latter wood being used in sufficient quantity to be classed separately for the first time in these statistics. The quantities reported for these species all represent increases over the amounts reported for the same woods in 1914. In addition to the different species of wood mentioned, several others were reported in amounts not sufficiently large to warrant their being listed separately for each of the years shown in the table. For this reason they have been grouped under the heading of "all other species" and include Douglas fir, white pine, sycamore, willow, buckeye, cucumber, beech, birch, and maple. The combined consumption of these woods by the industry in 1916 was 90,969 cords. The last item of consumption shown in the tabulation consists of 200,844 cords of slabs and other types of mill or woods waste. This material contributed 3.9 per cent of the total consumption in 1916, and less by 53,043 cords than the quantity reported in 1914.

Diagram 1 shows the comparative rank of the 12 leading woods employed by the industry from 1906 to 1916. The change in the relative position of several of them for the years mentioned is noticeable and reveals not only a growing scarcity of some of the higher priced woods but a tendency to turn toward species cheaper in price and of lesser pulp value, the commercial use of which has been made possible through scientific methods employed in their use at the mill.



DIAGRAM 1.—Relative Rank of the Twelve Leading Woods Used in the Manufacture of Pulp 1906-1916.



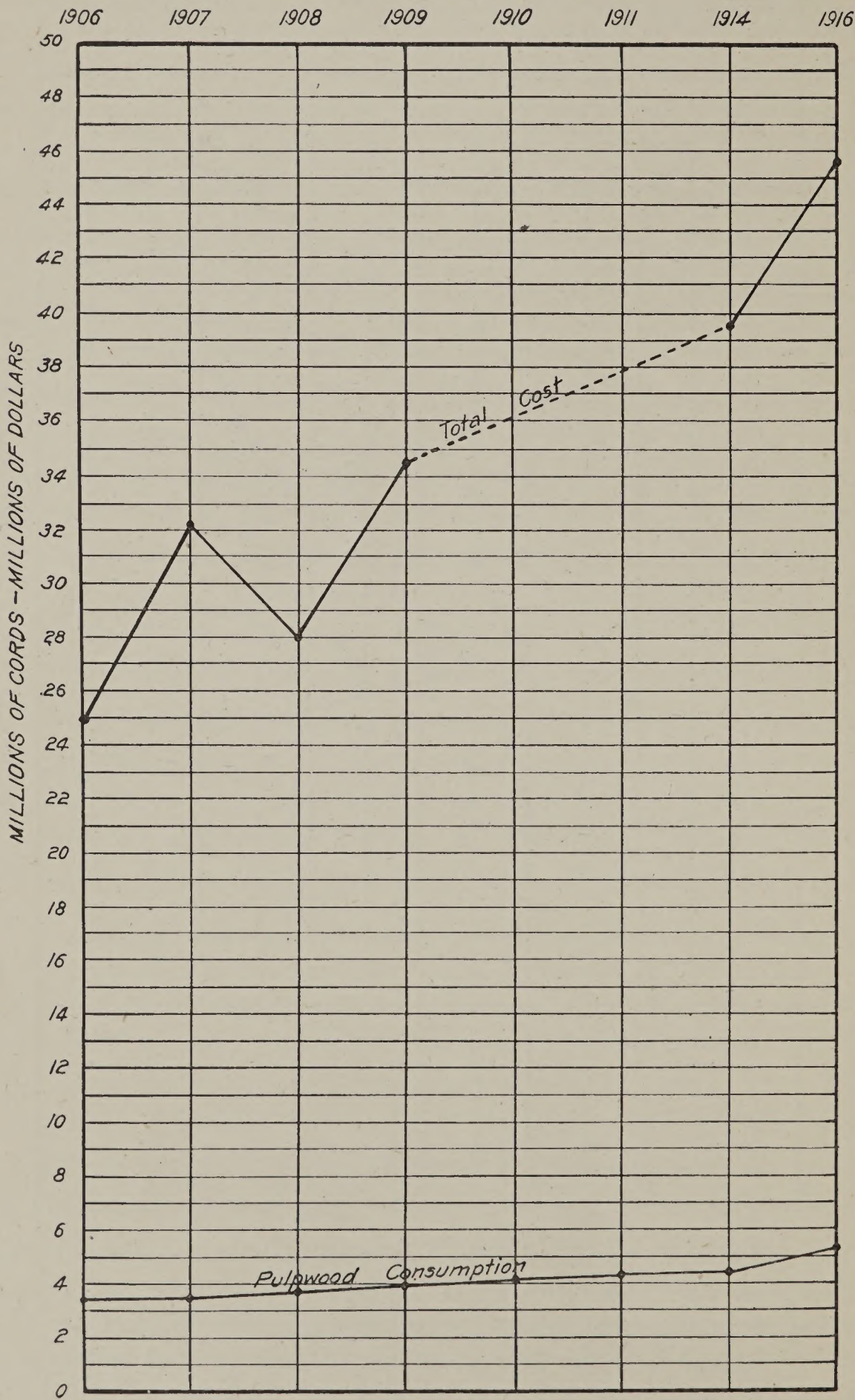
(a) Listed as Poplar prior to 1916.  
(b) Not reported separately prior to 1916.

Diagram 2 shows graphically the total cost and consumption of wood in the manufacture of pulp for the years 1906 to 1916. A gradual increase in pulpwood consumption is shown in the diagram for each year represented over the year preceding. The total cost figures were derived by multiplying the average cost per cord for all woods re-



ported by the total number of cords consumed. With the exception of 1908, a year of general business depression, an increase in the cost of the wood used by the industry is recorded. See page 14 for explanation of average prices.

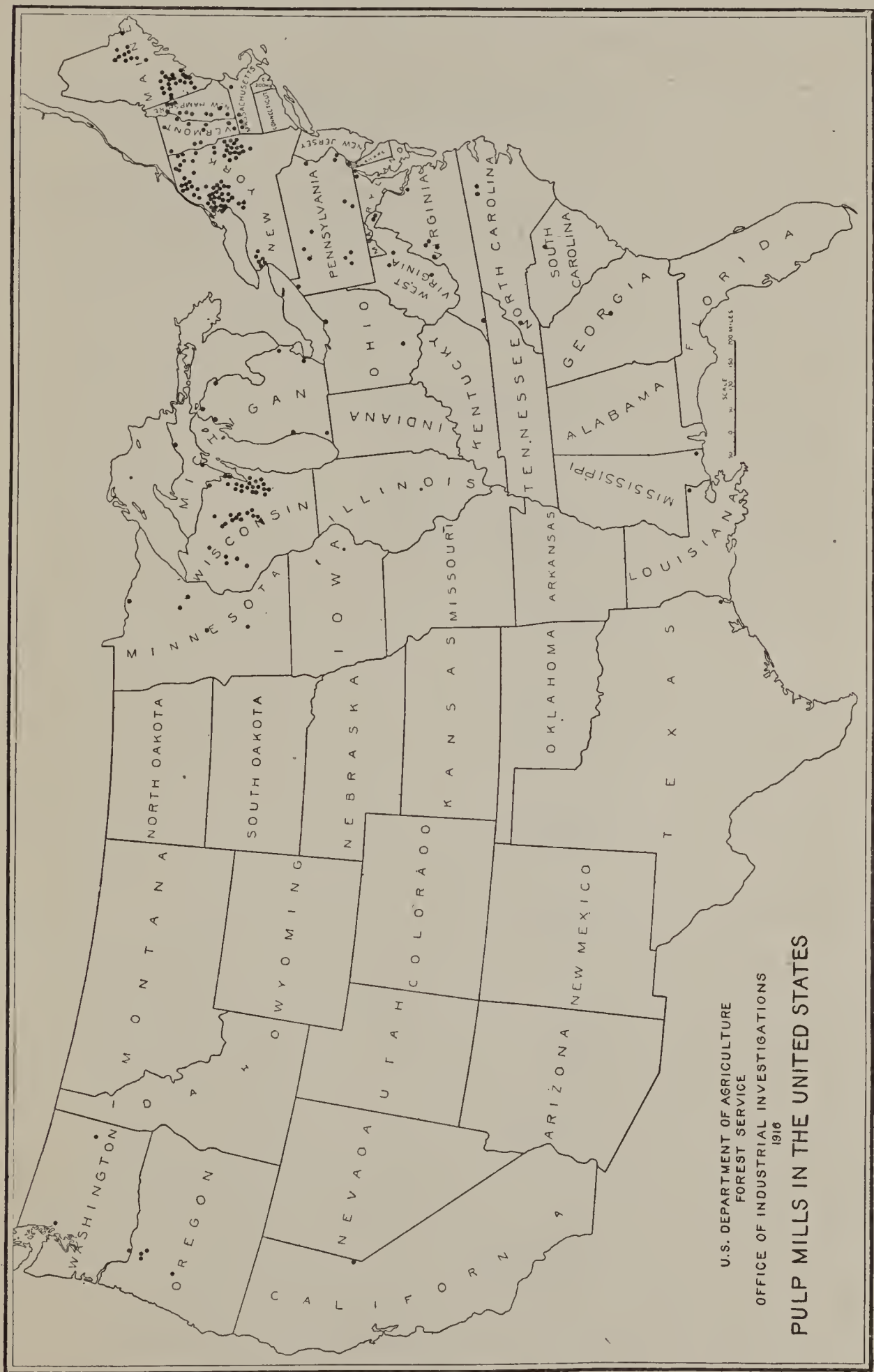
DIAGRAM 2 - COST AND CONSUMPTION OF PULPWOOD  
1906-1916



Note: Figures not available for Total Cost for years 1910 and 1911.



The location of the pulp mills in the United States is shown graphically on the accompanying map. In the preparation of the map, the main idea in mind was to indicate their apportionment among the different states, and not so much to show the exact location of each. The mills have been carefully plotted, however, and their location is considered to be reasonably accurate.



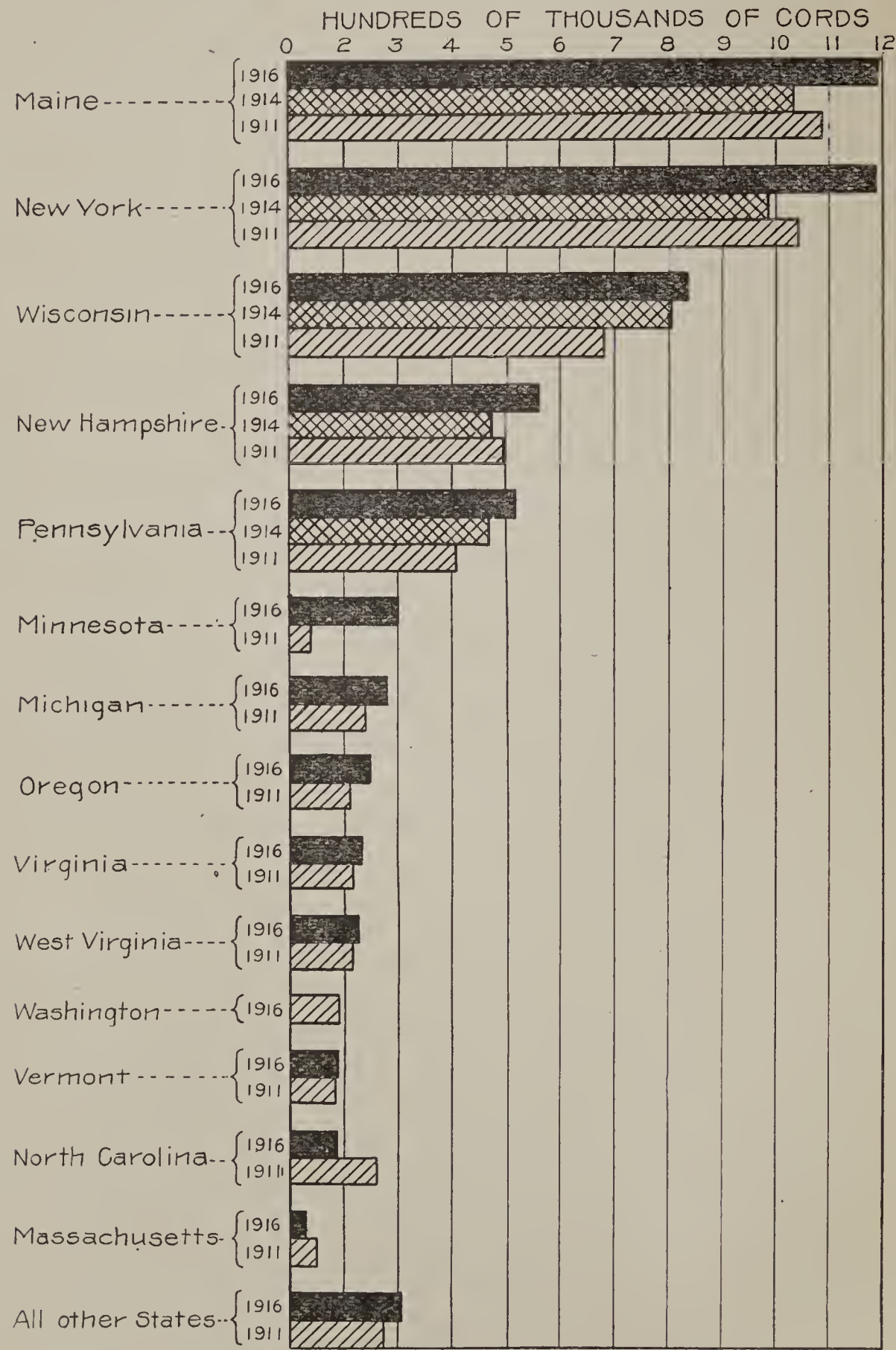


### Consumption of Pulpwood by States

In Diagram 3 is shown the standing of all of the states in the matter of pulpwood consumption for the years 1916 and 1911. This informa-

DIAGRAM 3.—Consumption of Pulpwood by States.

1911-1914-1916





tion for the five leading states in 1914 is also shown. The remainder of the states included in the statistics for that year are not listed for the reason that their consumption was not reported separately but was grouped under the heading of "All other States" and, if shown, would make this item for 1914 noncomparable with the corresponding figure for the years 1911 and 1916. Maine, which took first place in consumption from New York in 1914, still held the lead in 1916 by a fair margin.

Table 2 gives by states for 1916 and several previous years the consumption of pulpwood, its statistical average cost per cord and computed total cost, the number of mills reporting, and the total quantity of wood pulp which they produced. The statistics of the industry in 1914 covered not only the consumption of pulpwood and the production of wood pulp but also included the manufacture of paper. The number of establishments listed consisted of those which manufacture pulp or paper or both, and in addition the consumption of pulpwood was shown separately for only the five leading states. In the compilation of the 1911 report no cost figures were included. In view of these facts comparative statements of the various items listed in this table will be between tabulations for 1916 and those years for which comparable figures were obtained.

The average cost price per cord for pulpwood reported paid by the mills throughout the country varies considerably according to the species utilized and the condition of the wood—rough, peeled or rossed—and wide variations are in evidence among the mills in the same region or state. These differences are not irreconcilable, since cost systems in many of the leading industries form a much mooted question. Some mills cutting their own timber make a nominal book charge on the basis of the original purchase price and perhaps without a scientific adjustment to cover carrying charges or natural enhanced value. Other mills buying their supplies of wood in the open market paid rather a high price for material in 1916, and a figure that is not fairly comparable with that charged by the mills owning their own timber. Additional factors enter into the individual prices reported, such as long term stumpage rights, long or short rail or water hauls, actual competitive conditions, labor or contractual agreements and storage facilities. Not all of the mills reported the price paid for wood because of the belief that in some way these important details of their business might be revealed.



TABLE 2—Pulpwood consumption—Number of mills, quantity and cost of wood consumed, with average cost per cord, and quantity of pulpwood by States—1909-1916

STATE	WOOD CONSUMED					
	Year	Number of establishments	Quantity (Cords)	Average cost per cord	Total cost	Pulp produced (Tons)
United States	1916	230	5,228,558	\$8.76	\$45,785,682	3,271,310
	1914	223	4,470,763	9.30	39,408,453	2,893,150
	1911	268	4,328,052	<sup>1</sup>	<sup>1</sup>	2,686,134
	1909	253	4,001,607	8.62	34,477,540	2,491,406
Maine .....	1916	32	1,198,753	9.09	10,891,247	852,276
	1914 <sup>2</sup>	..	941,204	.....	.....	.....
	1911	38	955,768	.....	.....	623,242
	1909	37	903,962	9.15	8,267,958	603,852
New York ....	1916	75	1,094,513	11.05	12,098,608	787,397
	1914 <sup>2</sup>	..	894,098	.....	.....	.....
	1911	94	1,049,110	.....	.....	773,607
	1909	90	921,882	10.45	9,630,575	686,323
Wisconsin ....	1916	38	743,595	7.70	5,729,044	451,651
	1914 <sup>2</sup>	..	714,094	.....	.....	.....
	1911	48	591,918	.....	.....	334,363
	1909	37	576,019	7.46	4,294,229	324,509
New Hamp. ...	1916	11	471,041	9.81	4,623,146	341,365
	1914 <sup>2</sup>	..	381,958	.....	.....	.....
	1911	10	403,013	.....	.....	245,974
	1909	11	349,997	9.36	3,276,620	212,599
Pennsylvania .	1916	13	423,843	8.74	3,706,081	55,865
	1914 <sup>2</sup>	..	375,730	.....	.....	.....
	1911	14	315,682	.....	.....	147,624
	1909	15	295,038	7.25	2,139,087	135,525
Minnesota ....	1916	5	205,433	7.34	1,507,233	138,799
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	6	41,729	.....	.....	33,562
	1909	7	47,373	7.02	332,548	37,295
Michigan .....	1916	10	186,993	7.50	1,402,245	99,601
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	10	144,446	.....	.....	70,168
	1909	8	132,846	6.29	835,861	64,369
Virginia .....	1916	6	132,736	8.46	1,036,116	68,595
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	5	98,618	.....	.....	47,272
	1909	6	92,039	8.40	772,963	48,641
West Virginia.	1916	5	127,478	6.42	818,983	58,913
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	5	114,907	.....	.....	55,043
	1909	5	109,166	5.43	582,985	48,797
Vermont .....	1916	10	87,675	9.43	826,904	73,813
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	11	82,396	.....	.....	67,311
	1909	11	70,977	10.18	722,777	59,356
No. Carolina ...	1916	3	85,709	5.16	266,207	32,756
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	3	159,624	.....	.....	62,967
	1909	4	145,090	6.34	919,733	53,926
Massachusetts	1916	3	27,640	9.91	271,978	19,247
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	7	46,587	.....	.....	30,522
	1909	5	45,899	8.80	403,778	25,804
Calif., Oreg. and Washington	1916	8	259,544	5.67	1,472,736	188,782
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911	9	187,351	.....	.....	121,899
	1909	8	155,843	.....	1,172,556	110,371
All other States	1916 <sup>3</sup>	11	183,605	6.18	1,135,154	102,250
	1914 <sup>2</sup>	..	.....	.....	.....	.....
	1911 <sup>5</sup>	8	136,903	.....	.....	72,580
	1909 <sup>5</sup>	9	155,476	6.86	1,125,870	80,039

<sup>1</sup>—Figures not available.

<sup>2</sup>—Figures for 1914 collected by Census Bureau and only partial classification by States was shown.

<sup>3</sup>—Includes Delaware, Georgia, Louisiana, Maryland, Mississippi, Ohio, South Carolina, and Texas.

<sup>4</sup>—Includes all but five leading States. Not comparable with same figure for previous years.

<sup>5</sup>—Includes Delaware, Maryland, Ohio, South Carolina, and Texas.



A decided range in pulp wood prices is shown by the following tabulation of price levels reported and the number of mills reporting in each case.

**Range of Prices Paid for Pulpwood**

ROUGH		PEELED		ROSSED	
Number of mills	Price per cord	Number of mills	Price per cord	Number of mills	Price per cord
1	\$2.50 to \$2.99	1	\$2.25 to \$2.99	2	\$5.00 to \$5.99
3	3.00 " 3.99	1	3.00 " 3.99	3	6.00 " 6.99
16	4.00 " 4.99	4	4.00 " 4.99	2	7.00 " 7.99
26	5.00 " 5.99	11	5.00 " 5.99	5	8.00 " 8.99
17	6.00 " 6.99	19	6.00 " 6.99	1	9.00 " 9.99
27	7.00 " 7.99	17	7.00 " 7.99	6	10.00 " 10.99
26	8.00 " 8.99	17	8.00 " 8.99	3	11.00 " 11.99
21	9.00 " 9.99	25	9.00 " 9.99	7	12.00 " 12.99
16	10.00 " 10.99	17	10.00 " 10.99	4	13.00 " 13.99
5	11.00 " 11.99	12	11.00 " 11.99	7	14.00 " 14.99
1	14.00 .....	14	12.00 " 12.99	6	15.00 " 15.99
		11	13.00 " 13.99	1	16.00 " 16.99
		4	14.00 " 14.99	2	17.00 " 17.99
		5	15.00 " 15.99	2	18.00 " 18.50
		2	16.00 .....		

In 1916, slight increases were registered in some of the states in the number of mills reporting, while the reverse was true in others. The aggregate number reporting for the year, however, shows an increase of 7 mills over the number in 1914 and 38 less than reported in 1911. The 32 mills of Maine consumed the largest quantity of pulpwood, the total for the year being 1,198,753 cords, or 23 per cent of the total quantity reported. This represents an increase of 257,549 cords over the number reported in 1914. New York with 75 mills, as compared with 32 reporting from Maine, ranked second with 1,094,513 cords in contrast with 894,098 in 1914. Wisconsin, the third state in pulpwood consumption, reported 743,595 cords for the 38 mills in the state. Next in importance was New Hampshire, whose 11 mills used 471,041 cords, or 89,083 cords over the consumption shown for 1914. In Pennsylvania which ranked fifth a total of 13 mills consumed 423,843 cords of pulpwood or 48,113 cords in excess of the quantity used in 1914. These five states reported over three-fourths of the total pulpwood consumption for the year.

The consumption of the 5,228,558 cords of pulpwood reported by the industry in 1916 represents a total cost in raw material of \$45,785,682 or \$6,377,229 more than was spent for pulpwood by the mills reporting in 1914. The average cost per cord was \$8.76 or 54 cents less than the price paid in 1914. The highest average price paid for pulpwood occurred in New York where it brought \$11.05 per cord as compared with \$10.45 in 1909. The lowest average price was reported from



North Carolina and amounted to \$5.16 per cord or \$1.18 less than was paid by the mills of that state in 1909. The greatest increase in the average cost per cord in 1916 over the price reported in 1909 occurred in Pennsylvania and amounted to \$1.49, while the greatest reduction in average price amounting to \$1.76 per cord was reported by the mills of Oregon for the same years.

A total of 3,271,310 tons of wood pulp of all kinds was produced by the industry in 1916. This is 378,160 tons or 13 per cent more than was produced in 1914 and exceeds the quantities reported in 1911 and 1909 by 585,176 tons and 779,904 tons respectively. The average yield per cord of pulpwood irrespective of the kind of wood used or the process employed was 1,251 pounds in 1916 as compared with 1,294 pounds in 1914, 1,241 pounds in 1911 and 1,245 pounds in 1909. In the manufacture of pulp a close approximation of the average yield per cord of pulpwood by the mechanical or ground wood process is 2,000 pounds and about 1,000 pounds by the sulphite, soda and sulphate processes. A high average production of pulp per cord of wood in a state would therefore generally indicate that a large proportion of the wood reduced was by the mechanical process. Consequently, in comparing the quantities of pulp produced with the quantities of wood consumed in the different states, both the kind of wood and the processes employed must be borne in mind.

#### **Consumption of Pulpwood by Kind of Wood and by States**

In Table 3 is given the consumption of pulpwood by kinds and by states. Maine, at present the leading state in the consumption of pulpwood, used a total of 1,198,753 cords, of which 868,702 cords or 73 per cent was of domestic spruce and 53,346 or 4 per cent imported spruce. The consumption of aspen by the mills of this state was reported in the next largest quantity, the total being 187,520 cords or 15 per cent.

In New York, the second state in rank, spruce was also the principal species utilized and constituted 81 per cent of all wood reported by the state. Of the 884,915 cords used 508,785 was of domestic and 376,130 cords of foreign production.

In several instances spruce stumpage that under normal conditions would have been cut into saw logs was sent to the pulp mills because of the demand for pulpwood and the better price that could be realized in this manner for the timber.

In Wisconsin, the third state in importance, hemlock was the principal wood used and the 356,781 cords consumed was over three times as large as the quantity of this species reported by any other state.

New Hampshire, which ranked fourth, used spruce almost to the exclusion of all other species except balsam fir. Of the former 336,460



TABLE 3—Pulpwood consumption --Quantity of wood consumed by kinds and by States—1916

STATE	No. of estab- lishments	Total Cords	SPRUCE		Hemlock	ASPEN		Balsam fir	Yellow pine	Jack pine	White fir	Yellow poplar	Gum	Tama- rack	Cotton- wood	Bass- wood	All other species	Slab wood and other mill waste
			Domestic			Imported												
			Domestic	Imported		Domestic	Imported											
C O R D S																		
United States .....	230	5,228,558	2,399,993	701,667	760,226	329,370	82,326	301,032	90,310	80,068	49,425	37,974	37,391	33,271	22,211	11,481	90,969	200,844
Maine .....	32	1,198,753	868,702	53,346	17,520	187,520	7,200	35,808	.....	.....	.....	.....	.....	.....	.....	.....	628	28,029
New York .....	75	1,094,513	508,785	376,130	40,444	61,907	39,619	59,061	.....	.....	.....	.....	.....	.....	.....	976	.....	7,591
Wisconsin .....	38	743,595	281,347	16,624	356,781	3,558	.....	33,698	.....	.....	.....	.....	.....	28,019	.....	.....	856	8,385
New Hampshire .....	11	471,041	241,647	94,813	3,810	.....	.....	130,571	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Pennsylvania .....	13	423,843	24,560	89,368	64,993	13,375	35,200	6,000	.....	61,145	.....	.....	17,050	.....	.....	10,405	77,788	23,959
Minnesota .....	5	205,433	191,057	.....	.....	.....	.....	14,376	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michigan .....	10	186,993	35,798	41,625	72,023	2,383	.....	13,025	.....	4,479	.....	.....	.....	5,252	.....	.....	1,072	11,336
Virginia .....	6	132,736	63,720	.....	.....	.....	.....	.....	22,387	.....	.....	36,389	.....	.....	.....	.....	.....	10,240
West Virginia .....	5	127,478	65,353	.....	30,636	1,852	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29,637
Vermont .....	10	87,675	53,839	21,713	3,683	544	.....	7,779	.....	117	.....	.....	.....	.....	.....	.....	.....	.....
California, Oregon, and Washington ..	8	259,544	43,094	.....	137,919	.....	.....	.....	.....	.....	49,425	.....	.....	.....	19,711	.....	7,679	1,716
All other States <sup>1</sup> ....	17	296,954	22,091	8,048	32,417	58,231	307	714	67,923	.....	.....	1,585	20,341	.....	2,500	100	2,946	79,751

<sup>1</sup>—Includes Delaware, Georgia, Louisiana, Maryland, Massachusetts, Mississippi, North Carolina, Ohio, South Carolina, and Texas.



cords or 71 per cent were used and of the latter 130,571 cords or 28 per cent.

Three woods only were reported by the mills of North Carolina. The species used were hemlock, yellow pine and domestic spruce.\*

Pennsylvania reported the use of seven of the leading pulpwoods in addition to the miscellaneous woods included under the heading of "All other Species." The 17,050 cords of gum and the 10,405 cords of basswood consumed by the mills of this state were the largest quantities of these two woods reported.

The mills of North Carolina used the largest quantity of slab wood and other kinds of mill waste reported. West Virginia came next with 29,637 cords and Maine was third with 28,029 cords.

Of the consumption shown for "All other States" domestic aspen and yellow pine were the leading woods used and constituted 42 per cent of the total consumption for these states. Of the former there were reported 58,231 cords and of the latter 67,923 cords. No spruce was reported by these states and their total slab wood consumption was 79,751 cords.

### **Consumption of Pulpwood by Processes of Manufacture**

The consumption of pulpwood by kinds and processes of manufacture is given in Table 4. Of the total of 5,228,558 cords used during the year 2,856,122 cords or over 50 per cent were reduced by the sulphite process. The mechanical process was employed in the reduction of the next largest quantity amounting to 1,524,386 cords, and by the soda and sulphate processes there were manufactured into pulp 707,419 cords and 140,631 cords respectively. The figure given for wood reduced by the mechanical process represents 29 per cent of the total, while for that reduced by the soda and sulphate processes it was 13 per cent and 2 per cent in the order given.

Of the spruce consumed 58 per cent or 1,803,217 cords were reduced by the sulphite process and 1,293,508 or 42 per cent by the mechanical process. In addition 4,305 cords were manufactured into pulp by the sulphate process, while the soda process was employed in reducing 630 cords of this species.

In the manufacture of pulp from the hemlock consumed by the industry during 1916 a total of 647,738 cords or over 80 per cent were reduced by the sulphite process. Of the remaining 112,488 cords



84,116 or 11 per cent were reduced by the mechanical process and 28,372 cords or 4 per cent by the sulphate process.

**TABLE 4—Pulpwood consumption—Quantity of wood consumed, by kind and processes of manufacture—1916**

KIND OF WOOD	REDUCED BY				
	Aggregate quantity	Mechanical process	Sulphite process	Soda process	Sulphate process
	Cords	Cords	Cords	Cords	Cords
Total.....	5,228,558	1,524,386	2,856,122	707,419	140,631
Spruce .....	3,101,660	1,293,508	1,803,217	630	4,305
Hemlock .....	760,226	84,116	647,738	.....	28,372
Aspen .....	411,696	14,733	2,323	394,577	63
Balsam fir .....	301,032	77,313	213,569	.....	10,150
Yellow pine .....	90,310	15,663	8,209	29,727	36,711
Jack pine .....	80,068	13,935	.....	61,145	4,988
White fir .....	49,425	13,560	35,865	.....	.....
Yellow poplar .....	37,974	.....	.....	37,974	.....
Gum .....	37,391	.....	.....	37,391	.....
Tamarack .....	33,271	431	3,775	.....	29,065
Cottonwood .....	22,211	2,082	668	19,461	.....
Basswood .....	11,481	.....	.....	11,481	.....
Douglas fir .....	7,679	.....	.....	7,679	.....
White pine .....	2,545	1,473	.....	.....	1,072
Sycamore .....	2,246	.....	.....	2,246	.....
Willow .....	600	.....	.....	600	.....
Buckeye .....	100	.....	.....	100	.....
Cucumber .....	37	.....	.....	37	.....
Beech, birch, and maple ...	77,762	11	.....	77,751	.....
Slabs and other mill waste.	200,844	7,561	140,758	26,620	25,905

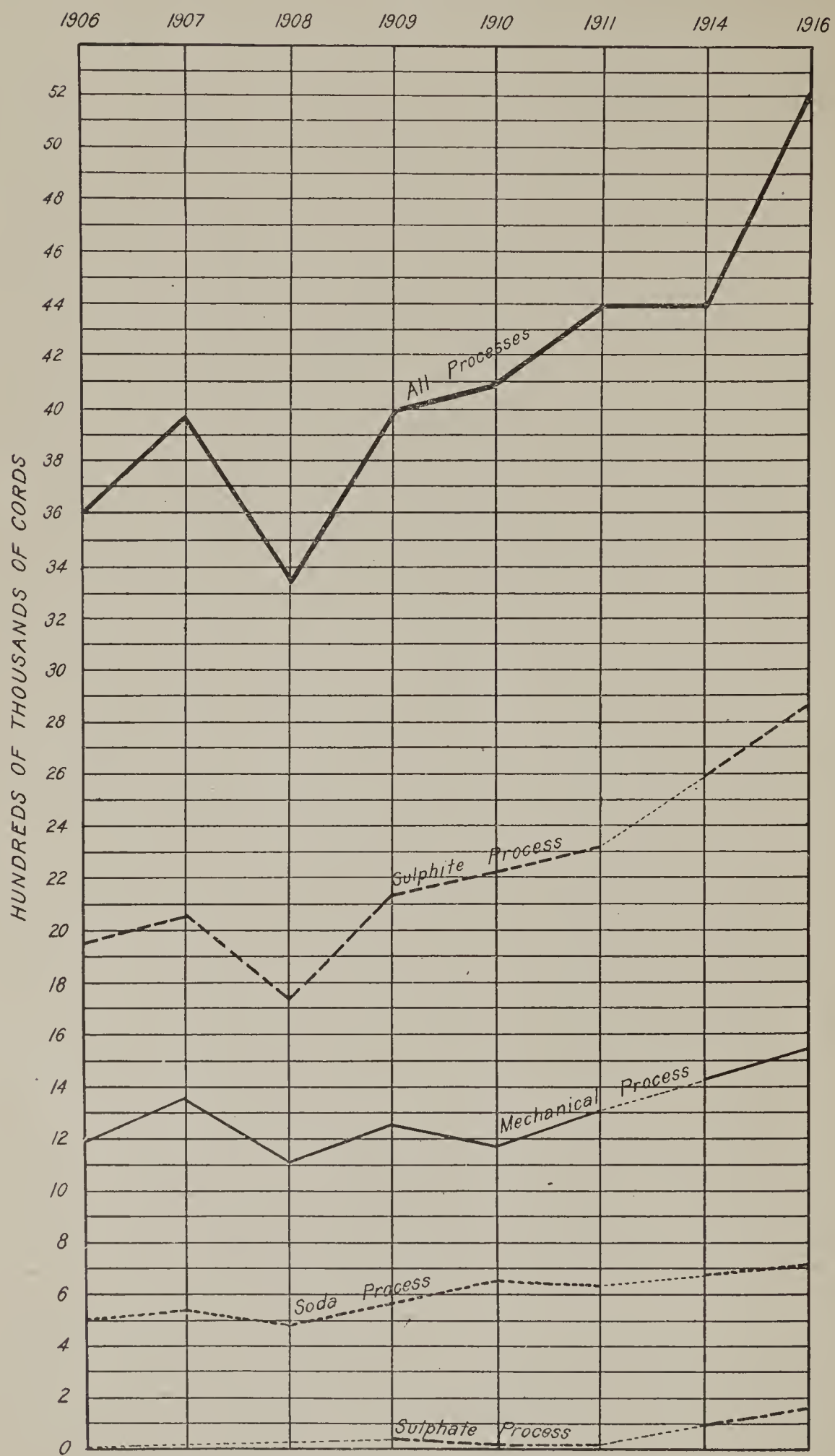
The bulk of the aspen consumption or 394,577 cords were reduced by the soda process. There were also reduced 14,733 cords of this species by the mechanical process, 2,323 cords by the sulphite process and 63 cords by the sulphate process.

The sulphite process was the principal method used in the reduction of balsam fir, while the sulphate and soda processes in the order named were employed in reducing over 73 per cent of the yellow pine. The soda process was the only one reported as being used in the manufacture of pulp from the yellow poplar and gum consumed. No white pine was reduced by either the sulphite or soda processes, while for the balance of the species listed, excepting slabs and other mill waste, the soda process was the principal method used.

Diagram 4 shows the consumption of pulpwood by the different processes employed. As indicated in this chart more wood is reduced to pulp by the sulphite process than by all other processes combined. Of the four methods shown the sulphate is the one least used.



DIAGRAM 4 - PULPWOOD CONSUMPTION BY PROCESSES  
1906 - 1916



Note: Figures not available showing Consumption by processes for 1914



### Condition of the Wood Consumed

The quantity, cost, and average cost per cord of the wood consumed in 1916, according to the form in which it was delivered at the mill, are shown by states in Table 5.

Wood used in the manufacture of pulp is received at the mill either rough, peeled or rossed. Rossing is done by machinery and peeling usually by hand. The cost per cord was in most cases less for rough wood than for peeled and highest for rossed wood. Certain exceptions to the rank in price for the three classes of raw material mentioned appear in the table, and are due to peculiar local conditions under which certain of the mills that reported are working.\*

Over 50 per cent of the total quantity of wood used by the industry in 1916, or 2,648,992 cords, was delivered at the mill peeled, while 34 per cent or 1,781,988 cords were received in the rough. Of the balance 596,734 cords or 11 per cent were rossed and 4 per cent or 200,844 cords were in the form of slabs and other kinds of mill waste. The average cost per cord of the peeled wood was \$9.54, while that of the rossed amounted to \$10.57 per cord. The rough wood brought an average price of \$7.58 per cord and \$4.63 was paid per cord for slab wood by those mills which used it. Rough and peeled wood was used by the mills in practically all states. Rossed wood, however, was reported by the mills in only 9 states, of which New York, Maine, Wisconsin and Minnesota, named in the order of greatest consumption, used 521,853 cords or 87 per cent. The use of rough wood was reported in the largest quantity by the mills of Wisconsin, while those of Maine consumed the greatest amount of peeled wood. New York used more rossed wood than any other state, while the largest consumption of wood in the form of slabs and other waste occurred in the mills of North Carolina.

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\* See table on page 13 showing range of prices paid for pulpwood.

TABLE 5—Pulpwood consumption—Quantity and cost of wood consumed, according to condition in which received at mill, with the average cost per cord, by States—1916

STATE	T O T A L			R O U G H			P E E L E D			R O S S E D			S l a b s   a n d   o t h e r   m i l l   w a s t e		
	Quantity Cords	Average cost per cord	Cost	Quantity Cords	Average cost per cord	Cost	Quantity Cords	Average cost per cord	Cost	Quantity Cords	Average cost per cord	Cost	Quantity Cords	Average cost per cord	Cost
United States . . . .	5,228,558	\$ 8.76	\$45,785,682 <sup>1</sup>	1,781,988	\$7.58	\$13,508,946	2,648,992	\$ 9.54	\$25,272,420	596,734	\$10.57	\$6,309,086	200,844	\$ 4.63	\$695,230 <sup>1</sup>
Maine . . . . .	1,198,753	9.09	10,891,247	302,120	8.81	2,661,092	772,249	9.37	7,234,191	96,255	9.20	886,203	28,029	3.91	109,761
New York . . . . .	1,094,513	11.05	12,098,608	150,998	9.46	1,28,874	652,942	10.99	7,177,146	282,982	12.13	3,431,914	7,591	7.99	60,674
Wisconsin . . . . .	743,595	7.70	5,729,044	625,801	7.72	4,830,801	33,593	7.60	255,474	75,816	8.08	612,274	8,385	3.64	30,495
New Hampshire . .	471,041	9.81	4,623,146	109,689	6.23	683,035	340,849	10.96	3,734,681	20,303	10.00	203,030	200	12.00	2,400
Pennsylvania . . . .	423,843	8.74	3,706,081	48,459	5.58	270,426	317,005	9.02	2,858,417	34,420	12.66	435,880	23,959	5.90	141,358
Minnesota . . . . .	205,433	7.34	1,507,233	131,498	7.07	930,151	7,235	6.01	43,482	66,700	8.00	533,600	11,336	3.38	38,322
Michigan . . . . .	186,993	7.50	1,402,245	96,840	8.12	786,736	77,434	7.33	567,457	1,383	7.04	9,730	10,240	3.38	38,322
Virginia . . . . .	132,736	8.46	1,036,116 <sup>2</sup>	9,566	6.00	57,396	112,930	8.67	978,720	18,537	10.47	194,075	29,637	4.86	144,129
West Virginia . . .	127,478	6.42	818,983	51,450	6.76	347,808	46,391	7.05	327,046	18,537	10.47	194,075	29,637	4.86	144,129
Vermont . . . . .	87,675	9.43	826,904	19,655	8.95	175,901	49,483	9.23	456,928	18,537	10.47	194,075	29,637	4.86	144,129
North Carolina . .	85,709	5.16	266,207 <sup>2</sup>	11,341	7.19	81,557	40,278	4.58	184,650	238	10.00	2,380	34,090	3.91	6,702
Massachusetts . . .	27,640	9.91	271,978	3,535	7.45	26,351	23,667	10.28	243,247	238	10.00	2,380	200	4.09	161,389 <sup>4</sup>
California, Oregon and Washington	259,544	5.67	1,472,736	196,009	5.88	1,153,208	61,819	5.06	312,826	113,117	6.18	898,155	1,716	3.91	6,702
All other States <sup>5</sup> .	183,605	6.18	1,135,154	25,027	3.02	75,610	113,117	7.94	898,155	113,117	6.18	898,155	45,461	4.09	161,389 <sup>4</sup>

<sup>1</sup>—Not including cost of “Slabs and other mill waste” in Louisiana, Massachusetts, North Carolina, and Virginia.

<sup>2</sup>—Not including cost of “Slabs and other mill waste.”

<sup>3</sup>—No cost reported.

<sup>4</sup>—Not including cost of “Slabs and other mill waste” in Louisiana.

<sup>5</sup>—Includes Delaware, Georgia, Louisiana, Maryland, Mississippi, Ohio, South Carolina, and Texas.



The quantity, cost, and average cost per cord of the wood consumed in 1916, according to the condition in which it was received at the mill, are given by kinds of wood in Table 6.

Nearly 50 per cent of the 2,399,993 cords of domestic spruce shown was delivered at the mill peeled. The quantity of peeled imported spruce consumed exceeded the rough and rossed consumption by 236,428 cords and 212,573 cords respectively. The quantity of rough hemlock received at the mill was 504,582 or nearly twice as much as was delivered in the peeled and rossed state together. The bulk of the domestic aspen was peeled, while the imported wood of this species consisted of peeled or rossed wood only. Over four times as much peeled Jack pine was reported delivered at the mills as was received in the form of rough wood, while no rossed wood of this species was received.

The 37,974 cords of yellow poplar reported was all received in the form of peeled wood. This was also true of the 37,391 cords of gum shown in the table. Of the total of 90,969 cords of wood included under the heading of "All other Species" 89,814 cords were of peeled wood and 1,155 cords were rough.

TABLE 6—Pulpwood consumption—Quantity and cost of wood consumed, according to condition in which received at the mill, with the average cost per cord, by kinds of wood—1916

	T O T A L			R O U G H			P E E L E D			R O S S E D			S l a b s   a n d   o t h e r   m i l l   w a s t e		
	Q u a n t i t y C o r d s	A v e r a g e c o s t   p e r c o r d	C o s t	Q u a n t i t y C o r d s	A v e r a g e c o s t   p e r c o r d	C o s t	Q u a n t i t y C o r d s	A v e r a g e c o s t   p e r c o r d	C o s t	Q u a n t i t y C o r d s	A v e r a g e c o s t   p e r c o r d	C o s t	Q u a n t i t y C o r d s	A v e r a g e c o s t   p e r c o r d	C o s t
Total .....	5,228,558	\$8.76	\$45,785,682	1,781,988	\$7.58	\$13,508,943	2,648,992	\$9.54	\$25,272,420	596,734	\$10.57	\$6,309,086	200,844	\$4.63	\$695,230 <sup>1</sup>
Spruce—Domestic .....	2,399,993	9.35	22,424,914	911,126	8.28	7,540,245	1,144,016	10.01	11,447,065	344,851	9.97	3,437,604	.....	.....	.....
—Imported .....	701,667	11.47	8,046,583	147,128	9.60	1,412,800	383,556	11.61	4,454,739	170,983	12.74	2,179,044	.....	.....	.....
Hemlock .....	760,226	6.60	5,017,041	504,582	6.48	3,268,282	193,920	6.58	1,275,445	61,724	7.67	473,314	.....	.....	.....
Aspen—Domestic .....	329,370	8.76	2,884,925	8,618	6.54	56,328	320,252	8.82	2,825,102	500	6.99	3,495	.....	.....	.....
—Imported .....	82,326	9.70	796,799	.....	.....	.....	81,226	9.67	785,799	1,100	10.00	11,000	.....	.....	.....
Balsam fir .....	301,032	9.79	2,946,634	92,334	6.96	643,024	192,002	10.97	2,05,823	16,696	11.85	197,787	.....	.....	.....
Yellow pine .....	90,310	5.17	466,937	34,593	3.84	133,006	55,717	5.99	333,931	.....	.....	.....	.....	.....	.....
Jack pine .....	80,068	7.52	602,074	15,588	5.87	91,440	64,480	7.92	510,634	.....	.....	.....	.....	.....	.....
White fir .....	49,425	5.46	269,714	39,065	5.53	215,842	10,360	5.20	53,872	.....	.....	.....	.....	.....	.....
Yellow poplar .....	37,974	7.36	279,395	.....	.....	.....	37,974	7.36	279,395	.....	.....	.....	.....	.....	.....
Gum .....	37,391	9.70	362,669	.....	.....	.....	37,391	9.70	362,669	.....	.....	.....	.....	.....	.....
Tamarack .....	33,271	5.50	182,930	27,652	5.09	140,735	4,739	7.46	35,353	880	7.78	6,842	.....	.....	.....
Cottonwood .....	22,211	5.09	112,977	147	6.77	995	22,064	5.08	111,982	.....	.....	.....	.....	.....	.....
Basswood .....	11,481	9.57	109,880	.....	.....	.....	11,481	9.57	109,880	.....	.....	.....	.....	.....	.....
All other species .....	90,969	6.45	586,980	1,155	5.41	6,249	89,814	6.47	580,731	.....	.....	.....	.....	.....	.....
Slabs and other mill waste .....	200,844	4.63	695,230	.....	.....	.....	.....	.....	.....	.....	.....	.....	200,844	4.63	695,230 <sup>1</sup>

<sup>1</sup>—Not including cost of "Slabs and other mill waste" in Louisiana, Massachusetts, North Carolina and Virginia.



## Wood Pulp Production

Table 7 shows the production of bleached and unbleached wood pulp by states and processes, together with the average value per ton\* and total value. Of the 230 establishments for which schedules were received 223 reported a total production of pulp in 1916 of 3,271,310 tons with an average value of \$35.47 per ton or a total value of \$116,041,343. Of this quantity 1,505,547 tons or 46 per cent were manufactured by the mechanical process and 1,401,600 tons or 42 per cent were produced by the sulphite process. The average value per ton of the former was \$21.62 and its total value \$32,547,704, while for the latter it was \$46.89 per ton with a total value of \$65,727,716 or more than twice as much for each item as is shown for the mechanical pulp. In addition to the pulp produced by the mechanical and sulphite processes there were also manufactured 290,724 tons by the soda and 73,439 tons by the sulphate processes. The average value per ton of the pulp produced by these methods was \$42.79 and \$72.53 respectively. The total value of the former was \$12,439,684 and of the latter \$5,326,239. Of the total wood pulp production during the year 203,001 tons were bleached and 3,068,309 tons or over 15 times as much was unbleached. The average value of bleached pulp was \$45.39 per ton as compared with \$34.82 per ton for the unbleached.

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\* Long ton, 2240 pounds.

TABLE 7—Production of bleached and unbleached wood pulp, by States and processes, with average value per ton, and total values—1916

State	T O T A L			M E C H A N I C A L			S U L P H U R E			S O D A			S U L P H A T E		
	Quantity (Tons)	Average value per ton	Total value	Quantity (Tons)	Average value per ton	Total value	Quantity (Tons)	Average value per ton	Total value	Quantity (Tons)	Average value per ton	Total value	Quantity (Tons)	Average value per ton	Total value
United States . . . .	3,271,310	\$35.47	\$116,041,343	1,505,547	\$21.62	\$32,547,704	1,401,600	\$46.89	\$65,727,716	290,724	\$42.79	\$12,439,684	73,439	\$72.53	\$5,326,239
Unbleached pulp															
New York . . . . .	787,397	34.75	27,358,729	470,959	21.71	10,224,520	270,261	55.37	14,964,352	46,177	46.99	2,169,857	.....	.....	.....
Maine . . . . .	745,791	29.84	22,253,426	436,974	21.62	9,447,378	252,386	40.41	10,198,918	56,431	46.20	2,607,130	.....	.....	.....
Wisconsin . . . . .	451,651	40.36	18,230,252	216,899	23.56	5,110,140	200,060	50.21	10,045,013	.....	.....	.....	34,692	88.64	3,075,099
New Hampshire	341,365	35.61	12,156,363	67,276	17.73	1,192,803	274,089	40.00	10,963,560	.....	.....	.....	.....	.....	.....
Minnesota . . . . .	138,799	43.85	6,086,694	93,843	31.03	2,912,405	44,956	70.61	3,174,289	.....	.....	.....	.....	.....	.....
Michigan . . . . .	99,601	55.01	5,479,077	20,944	18.34	384,113	69,170	57.20	3,956,524	.....	.....	.....	9,487	120.00	1,138,440
Vermont . . . . .	73,813	21.70	1,601,969	64,827	18.27	1,184,389	8,986	46.47	417,579	.....	.....	.....	.....	.....	.....
Virginia . . . . .	49,491	47.21	2,336,313	7,545	15.00	113,175	41,946	53.00	2,223,138	.....	.....	.....	.....	.....	.....
West Virginia . . .	34,172	33.97	1,160,688	6,496	21.04	136,676	27,676	37.00	1,024,012	.....	.....	.....	.....	.....	.....
North Carolina . .	32,756	48.67	1,590,170	2,225	21.62	48,105	25,800	46.47	1,198,926	.....	.....	.....	.....	.....	.....
Massachusetts . .	19,247	33.83	651,046	12,003	25.00	300,075	4,594	49.24	226,209	2,650	47.08	124,762	.....	.....	.....
Pennsylvania . . .	3,194	17.13	54,713	3,194	17.13	54,713	.....	.....	.....	.....	.....	.....	.....	.....	.....
Calif., Oreg. and Washington . . .	188,782	20.55	3,880,379	100,672	13.99	1,408,792	77,660	22.63	2,000,711	.....	.....	.....	.....	.....	.....
All other States <sup>1</sup>	102,250	38.02	3,987,802	1,690	18.00	30,420	8,633	35.82	309,228	67,398	44.18	2,878,593	24,529	31.37	769,561
Total . . . . .	3,068,309	34.82	106,827,621	1,505,547	21.62	32,547,704	1,306,217	46.49	60,702,459	183,106	45.06	8,251,219	73,439	72.53	5,326,239
Bleached pulp															
Maine . . . . .	106,485	46.29	4,929,213	.....	.....	.....	48,807	55.00	2,684,385	57,678	38.92	2,244,828	.....	.....	.....
Pennsylvania . . .	52,671	44.09	2,322,103	.....	.....	.....	21,835	52.33	1,142,626	30,836	38.25	1,179,477	.....	.....	.....
West Virginia . .	24,741	48.43	1,198,246	.....	.....	.....	24,741	48.43	1,198,246	.....	.....	.....	.....	.....	.....
Virginia . . . . .	19,104	40.00	764,160	.....	.....	.....	.....	.....	.....	19,104	40.00	764,160	.....	.....	.....
Total . . . . .	203,001	45.39	9,213,722	.....	.....	.....	95,383	52.69	5,000,257	107,618	38.92	4,188,465	.....	.....	.....

<sup>1</sup>—Includes Delaware, Georgia, Louisiana, Maryland, Mississippi, Ohio, South Carolina, and Texas.



As in the case of pulpwood, the figures which have been quoted are mathematical averages and do not reflect the range of wood pulp values. The value of any product is determined by its quality, and this truism applies to the wood pulp produced. The individual reports submitted indicated a wider range of pulpwood prices than of pulp prices due to a variety of causes inclusive of accounting systems (such as where only the actual cost of production in one part of the establishment was charged to another part of the same establishment), contracts covering more than one season where no readjustment on a cost basis was undertaken, extremely low grade products where the character of the pulp was practically slush, differences in quality, and an almost unprecedented demand for stock. In referring to the average values as set forth due consideration must be given to all of the facts relative to the conditions bearing on the individual establishment value and the computation of the published mathematical average.

Maine took first place in wood pulp production with a total of 852,276 tons, of which 106,485 tons were bleached and 745,791 tons unbleached. Of the unbleached pulp produced by the mills of this state 436,974 tons or more than 50 per cent were manufactured by the mechanical process. New York was second in rank with a total production of 787,397 tons, all of which was unbleached. As was the case in Maine over 50 per cent of this pulp was produced by the mechanical process. Wisconsin with a total production of 451,651 tons of unbleached pulp only came third. Of the total quantity reported from this state 216,899 tons were produced by the mechanical process, 200,060 tons by the sulphite process and 34,692 tons by the sulphate process. All of the 341,365 tons of pulp produced by the mills of New Hampshire, the state fourth in importance, were of unbleached stock. In this state the sulphite and the mechanical processes were the only ones used. By the former 274,089 tons of pulp were produced and by the latter 67,276 tons. Minnesota ranked fifth among the states in wood pulp production with 93,843 tons of mechanical and 44,956 tons of sulphite pulp. All of the material reported was unbleached.

In addition to the 106,485 tons of bleached pulp reported by the mills of Maine there were also produced 52,671 tons in Pennsylvania, 24,741 tons in West Virginia and 19,104 tons in Virginia. All of the bleached pulp reported was manufactured either by the sulphite or soda processes.

### **Imports and Exports of Pulpwood, Wood Pulp and Paper**

Tables 8 to 12 inclusive were prepared from statistics compiled by the Department of Commerce and are intended to show the trend of foreign and domestic traffic in pulpwood, wood pulp and paper for the calendar years 1907 to 1916 inclusive. Because of changed classifications it is not possible to make direct comparisons for all years. The

data are embodied in this report because of the frequent need for such information in connection with figures on domestic conditions. The figures on imports of pulpwood for 1916 shown in Table 8 do not harmonize with the consumption reported by the mills for the same period. The difference is accounted for, however, by the fact that raw material is frequently stored by the mills in the prospect of a scarcity or higher market price in the succeeding years.

TABLE 8—Imports of pulpwood—calendar years 1907 to 1916

Year			Quantity Cords	V A L U E	
				Total	Average per cord
	Total		9,407,946	\$59,596,370	\$6.33
1916			1,097,577	7,202,570	6.56
1915			975,974	6,278,948	6.43
1914			999,649	6,773,198	6.78
1913			1,034,885	7,007,350	6.77
1912			933,565	6,227,346	6.67
1911			889,257	5,682,716	6.39
1910			931,731	6,109,574	6.56
1909			907,963	5,613,710	6.18
1908			810,256	4,698,163	5.80
1907			827,089	4,002,795	4.84
	Condition	Per cent			
1916	Rough	17.4	190,921	1,132,912	5.93
	Peeled	67.6	742,337	4,770,821	6.43
	Rossed	15.0	164,319	1,298,837	7.90
		100.0			
1915	Rough	26.5	258,620	1,503,939	5.82
	Peeled	55.8	544,139	3,419,046	6.28
	Rossed	17.7	173,215	1,355,963	7.83
		100.0			
1914	Rough	19.8	198,414	1,197,754	6.04
	Peeled	60.0	599,299	3,837,084	6.40
	Rossed	20.2	201,936	1,738,360	8.61
		100.0			
1913	Rough	18.9	195,906	1,108,320	5.66
	Peeled	56.2	581,756	3,764,958	6.47
	Rossed	24.9	257,223	2,134,072	8.30
		100.0			
1912	Rough	14.9	139,002	838,103	6.03
	Peeled	56.7	528,900	3,203,577	6.06
	Rossed	28.4	265,663	2,185,666	8.23
		100.0			
1911	Rough	21.5	191,062	1,039,789	5.44
	Peeled	53.2	473,116	2,829,551	5.98
	Rossed	25.3	225,079	1,813,376	8.06
		100.0			
1910	Rough	24.7	229,691	1,338,297	5.83
	Peeled	49.3	459,681	2,888,351	6.28
	Rossed	26.0	242,359	1,882,926	7.77
		100.0			

Note.—The value of merchandise imported is the actual market value at wholesale price thereof at the time of exportation to the United States in the principal markets of the country from whence exported.



TABLE 9—Imports of wood pulp—calendar years 1907 to 1916

Year	Average value per ton	Total		MECHANICALLY GROUND				C H E M I C A L									
				Unbleached		Sulphate (Unbleached)		Sulphite (Unbleached)		Bleached		Sulphate (bleached)		Sulphite (bleached)			
		Quantity (Long tons)	Value	Quantity (Long tons)	Value	Quantity (Long tons)	Value	Quantity (Long tons)	Value	Quantity (Long tons)	Value	Quantity (Long tons)	Value	Quantity (Long tons)	Value		
Total	\$33.23	4,458,416	\$148,149,784	1,525,530	\$27,459,269	1,786,427	\$65,578,721	54,380	\$3,150,420	153,886	\$10,822,256	562,323	\$28,653,439	4,118	\$302,909	17,009	\$1,251,976
1916	44.02	610,504	26,985,693	234,390	4,696,801	120,575 <sup>1</sup>	5,255,297 <sup>1</sup>	54,380	3,150,420	153,886	10,822,256	26,146 <sup>1</sup>	1,506,034 <sup>1</sup>	4,118	302,909	17,009	1,251,976
1915	33.36	507,481	16,907,026	155,407	2,588,846	287,232	10,954,182	.....	.....	.....	.....	64,842	3,363,998	.....	.....	.....	.....
1914	33.84	603,183	20,411,225	193,979	3,246,933	294,884	11,180,232	.....	.....	.....	.....	114,320	5,984,060	.....	.....	.....	.....
1913	32.96	483,442	15,935,517	149,901	2,670,781	264,513	9,676,380	.....	.....	.....	.....	69,028	3,588,356	.....	.....	.....	.....
1912	30.90	482,277	14,903,218	165,896	3,051,381	247,501	8,477,766	.....	.....	.....	.....	68,880	3,374,071	.....	.....	.....	.....
1911	28.66	502,165	14,394,253	234,537	4,221,948	190,394	6,482,360	.....	.....	.....	.....	77,234	3,689,945	.....	.....	.....	.....
1910	29.38	452,478	13,296,500	200,164	3,578,316	183,701	6,374,762	.....	.....	.....	.....	68,613	3,343,422	.....	.....	.....	.....
1909	31.42	328,259	10,315,089	127,669	2,266,668	144,350	5,189,794	.....	.....	.....	.....	56,240	2,858,627	.....	.....	.....	.....
1908	31.19	223,647	6,976,311	63,587 <sup>2</sup>	1,137,595 <sup>2</sup>	53,277 <sup>2</sup>	1,987,948 <sup>2</sup>	.....	.....	.....	.....	17,020 <sup>2</sup>	944,926 <sup>2</sup>	.....	.....	.....	.....
1907	30.29	264,980	8,024,952	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

1—Figures from January 1 to June 20, only. Beginning July 1, 1916, imports of chemical pulp, both bleached and unbleached, were further subdivided into sulphate and sulphite, and in subsequent years there will probably be no item shown for either bleached or unbleached chemical.

2—Figures from July to December only. Imports of wood pulp form and kind not specified, January to June, inclusive, were 89,763 tons, valued at \$2,905,842.

TABLE 10—Exports of wood pulp—calendar years 1907 to 1916

Year	Quantity (Long tons)	V A L U E	
		Total	Average per ton
Total .....	140,308	\$6,829,157	\$48.67
1916 .....	35,735	2,121,745	59.37
1915 .....	18,120	820,134	45.26
1914 .....	11,015	484,477	43.98
1913 .....	17,657	738,451	41.82
1912 .....	12,669+	542,949	42.86
1911 .....	8,477—	386,711	45.62
1910 .....	7,465+	344,251	46.12
1909 .....	7,994—	368,738	46.13
1908 .....	10,087+	514,084	50.97
1907 .....	11,089—	507,617	45.78



TABLE 11—Imports of paper—calendar years 1907 to 1916

Year	All other printing		Newsprint		Wrapping		Printing paper for books and newspapers		"All other" paper (1)
	Quantity (Pounds)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value	
1916	1,259,761	\$119,802	936,460,899	\$18,527,748	7,103,661	\$ 280,932	.....	.....	\$.....
1915	2,395,755	161,703	736,817,721	14,138,651	22,208,212	626,661	.....	.....	.....
1914	5,752,447	261,616	630,950,295	12,189,792	41,080,659	1,156,591	.....	.....	.....
1913	7,422,730	391,319	439,022,955	8,529,041	.....	735,857	.....	.....	.....
1912	5,597,094	292,242	171,186,402	3,262,778	.....	846,500	.....	.....	.....
1911	7,376,598	534,250	111,660,615	2,096,105	.....	400,535	.....	.....	.....
1910	1,980,267 <sup>2</sup>	135,686 <sup>2</sup>	113,321,643	2,182,241	.....	.....	.....	.....	.....
			Surface-coated paper						
1909	.....	.....	.....	.....	2,207,404 <sup>2</sup>	258,125 <sup>2</sup>	49,822,397	1,146,885	5,989,417
1908	.....	.....	.....	.....	.....	.....	18,734,667 <sup>2</sup>	445,472 <sup>2</sup>	5,985,033
1907	.....	.....	.....	.....	.....	.....	.....	.....	7,655,680

<sup>1</sup>—The classifications of the imports of "Paper and manufactures of paper" are: (1) Books, music, maps, engravings, etchings, photographs, and other printed matter; (2) Lithographic labels and prints; (3) Photographic; (4) Printing paper for books and newspapers; (5) Surface-coated; (6) All other.

<sup>2</sup>—Figures are for period from July 1.



TABLE 12—Exports of paper—calendar years 1907 to 1916

Year	All other printing		Newsprint		Wrapping		Printing paper for books and newspapers		“All other” paper (1)
	Quantity (Pounds)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value	Quantity (Pounds)	Value	
1916	123,691,626	\$8,034,451	152,655,459	\$4,094,775	83,433,793	\$4,007,536	.....	.....	.....
1915	44,657,646	2,169,067	110,322,513	2,707,626	36,991,079	1,667,387	.....	.....	.....
1914	30,259,588	1,568,960	121,578,332	2,983,344	14,815,496	522,951	.....	.....	.....
1913	28,117,371	1,617,285	86,602,057	2,105,984	13,722,414	560,535	.....	.....	.....
1912	26,904,552	1,440,992	111,135,997	2,690,225	7,034,849 <sup>2</sup>	283,506 <sup>2</sup>	.....	.....	.....
1911	26,429,186	1,278,796	97,841,361	2,357,455	.....	.....	.....	.....	.....
1910	55,385,981	1,909,061	49,497,857 <sup>2</sup>	1,198,893 <sup>2</sup>	.....	.....	.....	.....	.....
1909	.....	.....	.....	.....	.....	.....	.....	.....	.....
1908	.....	.....	.....	.....	.....	.....	97,480,857	2,832,793	4,218,124
1907	.....	.....	.....	.....	.....	.....	59,980,301	1,867,715	3,944,758
							76,480,473	2,319,303	4,668,213

<sup>1</sup>—The classifications of the exports of “Paper and manufactures of paper” are: (1) Books, maps, engravings, etchings, and other printed matter; (2) Paper hangings; (3) Playing cards; (4) Printing paper; (5) Writing paper and envelopes; (6) All other.

<sup>2</sup>—Figures are for period from July 1.





